

H0129-TW



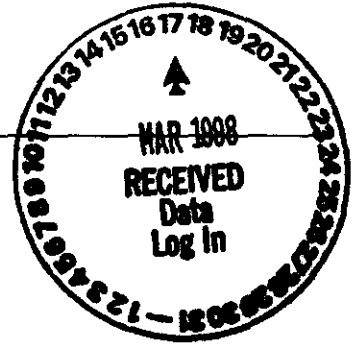
**RECRA
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

0049216

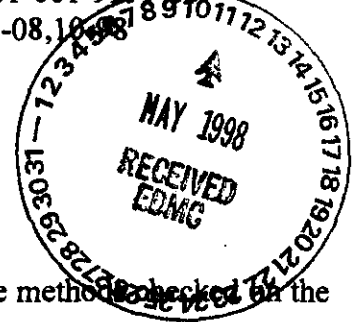
**Recra LabNet Philadelphia
Analytical Report**



Client : TNU-HANFORD
RFW# : 9801L019,062
SDG# : H0129

W.O. # : 10985-001-001-9999-00

Date Received: 01-08, 1998



INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 15 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler temperatures were recorded on the chain-of-custody.
5. The method blank for Cation Exchange Capacity (CEC) was within method criteria.
6. The Laboratory Control Samples (LCS) for CEC were within the laboratory control limits. The duplicate LCS was within the 20% Relative Percent Difference (RPD) control limit.
7. The replicate analysis for CEC was within the 20% RPD control limit, however the replicate analysis for Percent Moisture was outside the control limit.
8. Results for solid CEC samples are reported on a dry weight basis.

for Bruce C. Miller, Unit Leader
J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2.23.98
Date

njpl01-019,062

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 21 pages.



COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Date: 02-19-98

Laboratory Batch: 9801L019,062

W.O.#: 10985-001-001-9999-00

Collection Dates: 12-
29, 30, 31 - 97

01-02,03,05,07-

98

SAMPLE NUMBER	LAB SAMPLE ID
BOMJD0	9801L019-001
BOMJC4	9801L019-002
BOMJD6	9801L019-003
BOMJD9	9801L019-004
BOMJF5	9801L019-005
BOMJJ3	9801L019-006
BOMJJ6	9801L019-007
BOMJF8	9801L019-008
BOMJH1	9801L019-009
BOMJK2	9801L019-010
BOMJK5	9801L019-011
BOMJJ9	9801L019-012
BOMJD3	9801L019-013
BOMJC7	9801L019-014
BOMJK8	9801L062-001

WET CHEMISTRY

METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
%Ash	<input checked="" type="checkbox"/> D2216-80		
%Moisture	<input checked="" type="checkbox"/> D2216-80		<input type="checkbox"/> ILMO4.0 (e)
%Solids			<input type="checkbox"/> ILMO4.0 (e)
%Volatile Solids	<input type="checkbox"/> D2216-80		
ASTM Extraction in Water	<input type="checkbox"/> D3987-81/85		
BTU	<input type="checkbox"/> D240-87		
CEC		<input checked="" type="checkbox"/> 9081	<input type="checkbox"/> c
Corrosivity <input type="checkbox"/> by coupon <input type="checkbox"/> by pH		<input type="checkbox"/> 1110 (mod) <input type="checkbox"/> 9045	
Cyanide, Total		<input type="checkbox"/> 9010	<input type="checkbox"/> ILMO4.0 (e)
Cyanide, Reactive		<input type="checkbox"/> Sec 7.3	
Density			<input type="checkbox"/> b
Halides, Extractable Organic			<input type="checkbox"/> EPA 600/4/84-008 (mod)
Halides, Total			<input type="checkbox"/> EPA 600/4/84-008 (mod)
EP-Toxicity		<input type="checkbox"/> 1310A	
Flash Point		<input type="checkbox"/> 1010	
Ignitability		<input type="checkbox"/> 1010	
Carbon, Total Organic (by LOI)			<input type="checkbox"/> c
Oil and Grease		<input type="checkbox"/> 9071A	
Carbon, Total Organic		<input type="checkbox"/> 9060	<input type="checkbox"/> Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions <input type="checkbox"/> D240-87 (mod)		<input type="checkbox"/> 5050	
Petroleum Hydrocarbons, Total Recoverable		<input type="checkbox"/> 9071	<input type="checkbox"/> EPA 418.1 (mod)
pH, Soil		<input type="checkbox"/> 9045B	
Sulfide, Reactive		<input type="checkbox"/> Sec 7.3	
Specific Gravity	<input type="checkbox"/> D1429-76C		
Sulfur, Total		<input type="checkbox"/> 9056	
TCLP		<input type="checkbox"/> 1311	
TCLV		<input type="checkbox"/> 1311	
Synthetic Precipitation Leach		<input type="checkbox"/> 1312	
Chlorine, Total		<input type="checkbox"/> 9056	
Paint Filter		<input type="checkbox"/> 9095	

Other: _____

Method: _____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.
2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
 - a. Standard Methods for the Examination of Water and Waste, 16 ed., (1989).
 - b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)
 - c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd. Ed. (1986)
 - d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965)
 - e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
 - f. Code of Federal Regulations.

RFW 21-21L-034/D-06/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 02/19/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9801L019

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	BOMJD0	% Moisture	4.3	%	0.01	1.0
		Cation Exchange Capacit	6.3	u MEQ/100g	6.3	1.0
-002	BOMJC4	% Moisture	6.4	%	0.01	1.0
		Cation Exchange Capacit	7.8	MEQ/100g	6.4	1.0
-003	BOMJD6	% Moisture	3.8	%	0.01	1.0
		Cation Exchange Capacit	6.2	u MEQ/100g	6.2	1.0
-004	BOMJD9	% Moisture	3.3	%	0.01	1.0
		Cation Exchange Capacit	7.3	MEQ/100g	6.2	1.0
-005	BOMJF5	% Moisture	9.9	%	0.01	1.0
		Cation Exchange Capacit	11.9	MEQ/100g	6.7	1.0
-006	BOMJJ3	% Moisture	3.3	%	0.01	1.0
		Cation Exchange Capacit	6.2	u MEQ/100g	6.2	1.0
-007	BOMJJ6	% Moisture	2.3	%	0.01	1.0
		Cation Exchange Capacit	6.1	u MEQ/100g	6.1	1.0
-008	BOMJF8	% Moisture	3.2	%	0.01	1.0
		Cation Exchange Capacit	6.3	MEQ/100g	6.2	1.0
-009	BOMJH1	% Moisture	3.0	%	0.01	1.0
		Cation Exchange Capacit	6.2	u MEQ/100g	6.2	1.0
-010	BOMJK2	% Moisture	7.5	%	0.01	1.0
		Cation Exchange Capacit	6.5	u MEQ/100g	6.5	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 02/19/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9801L019

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-011	BOMJK5	% Moisture	6.6	%	0.01	1.0
		Cation Exchange Capacit	6.4	u MEQ/100g	6.4	1.0
-012	BOMJJ9	% Moisture	2.6	%	0.01	1.0
		Cation Exchange Capacit	6.2	u MEQ/100g	6.2	1.0
-013	BOMJD3	% Moisture	3.6	%	0.01	1.0
		Cation Exchange Capacit	7.0	MEQ/100g	6.2	1.0
-014	BOMJC7	% Moisture	8.6	%	0.01	1.0
		Cation Exchange Capacit	9.3	MEQ/100g	6.6	1.0

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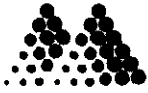
INORGANICS DATA SUMMARY REPORT 02/19/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9801L062

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	BOMJK8	% Moisture	6.8	%	0.01	1.0
		Cation Exchange Capacit	6.4	u MEQ/100g	6.4	1.0



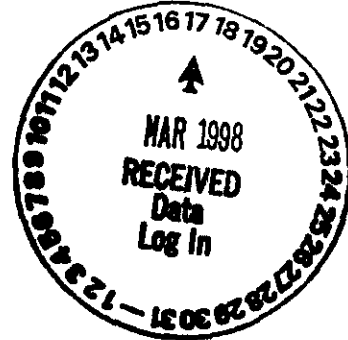
Mountain States Analytical, Inc.

February 9, 1998

Mr. Kyle Clay
RECRA Enviromental, Inc.
208 Welsh Pool Road
Lionville, PA 19341

Reference:

Project: WHC/TMA 10985-001-001-9999-000
MSAI Group: 19448



Dear Mr. Clay:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

BOMJDO	BOMJC4	BOMJD6
BOMJD9	BOMJF5	BOMJJ3
BOMJJ6	BOMJF8	BOMJH1
BOMJK2	BOMJK5	BOMJJ9
BOMJD3	BOMJC7	BOMJK8

All holding times were met for the tests performed on these samples.

If the report is acceptable, please approve the enclosed invoice and forward it for payment.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

W. Scott Fraser
Project Manager

EXPLANATION OF SYMBOLS AND ABBREVIATIONS

The following defines common symbols and abbreviations used in reporting technical data.

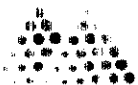
1. < means "less than." The number following the sign is the **smallest** amount which can be quantified using the **specific** test.
2. > means "greater than."
3. **N.D.** means "none detected."
BLOQ means "Below Limit of Quantitation."
TNTC means "Too Numerous to Count."
4. **MPN** means "Most Probable Number." Used in reporting certain bacteriological results which are calculated from a statistical formula related to bacterial count observed in a series of dilutions of the sample.
5. **IU** means "International units." Used in reporting results on certain Vitamin assays.
6. **CP Units** means "cobalt-chloroplatinate units." Used in reporting color of aqueous solutions.
7. **umhos/cm** means "reciprocal micromhos/cm or microsiemens." Used in reporting specific conductance of solutions.
8. **NTU** means "nephelometric turbidity units."
9. **fib>5 um/ml** means "fibers greater than 5 microns in length, per ml."
10. **C** and **F** represent degrees of temperature and refer to Celsius and Fahrenheit respectively.
11. **Cal** means (diet) calories.
12. **lb.** means pound (s).
13. **meq** means milliequivalents, a chemical term meaning 1/1,000 of the equivalent weight of substance or element.
14. **g** means "gram(s)." The unit of weight used in the metric system. One gram equals about 1/30th of an ounce.
kg means "kilogram(s)." One kilogram is 1,000 grams.
mg means "milligram(s)." One milligram is 1/1,000 of a gram.
ug means "microgram(s)." One-millionth of a gram.
15. **l** means "liter(s)." The unit of volume used in the metric system.
ml means "milliliter(s)." One milliliter is 1/1,000 of a liter.
ul means "microliter(s)." One microliter 1/1,000 of a milliliter or one-millionth of a liter.
16. **m3** means "cubic meter(s)." Usually used as a volume unit in air analyses.
17. **ppm** means "parts per million." One ppm is equivalent to one microgram per gram, or one gram per million grams. For aqueous liquids ppm is usually taken to be equivalent to milligrams per liter, because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.
18. **ppb** means "parts per billion." One ppb is 1/1,000 of a ppm.
19. **%** means "percent" or part per hundred. This is usually followed by the designation "by weight," meaning grams per hundred grams. If followed by the designation "by volume," it refers to volume per unit volume, e.g., milliliters per hundred milliliters.

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Clients should be aware that a most important step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of the material involved, the test results will be meaningless. If you have any questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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WARRANTY AND LIMITATION OF LIABILITY. In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. We disclaim any other warranties, expressed or implied, including a Warranty of Fitness for particular Purpose and Warranty of Merchantability. We accept no legal responsibility for the purpose for which the client uses the test results. No purchase order or other order for work shall be accepted by the company with any conditions that vary from our Standard Terms and Conditions, if Mountain States Analytical performs work requested by the client, conditions at variance to our Standard Terms and Conditions are not part of the contract.



Southwest States Analytical, Inc.

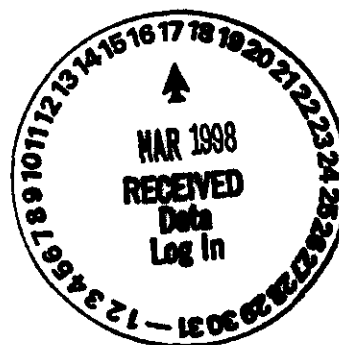
435 PA Blvd.
108 Welsh Rd.
Lionville PA 19353

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001 001-9999-000

Sample ID: BOMJDO
Matrix: Solid

MSAI Group 1448
Date Reported: 02/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 12/30/97
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	96.3	% Passing	0.1
	No. 4 Sieve	63.1	% Passing	0.1
	No. 40 Sieve	3.7	% Passing	0.1
	No. 200 Sieve	1.0	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.43		0.001



This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,
Reviewed and Approved by:

W. Scott Fraser

W. Scott Fraser
Project Manager

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Years of
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Corporate Office
1645 West 2200 South, Salt Lake City, Utah 84119
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278
e-mail: service@msalabs.com

Southwest States Region
6223 Bayonne, Spring, Texas 77389
281-320-2842 • FAX 281-320-0989
e-mail: gbrewer@msalabs.com





Midwest Standards Analytical, Inc.

For Quality Control

PO Box 1000
1000 Welsh Road
Lionville, PA 19353

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985 001-001-9999-000

Sample ID: BOMJC4
Matrix: Solid

Analysis: 100.0
Date Reported: 12/09/97
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 12/29/97
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	85.3	% Passing	0.1
	No. 4 Sieve	66.9	% Passing	0.1
	No. 40 Sieve	2.3	% Passing	0.1
	No. 200 Sieve	1.5	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.51		0.001

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Reviewed and Approved by:

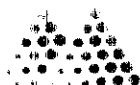

W. Scott Fraser
Project Manager

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e-mail: gbrewer@msalabs.com





Mountain States Analytical, Inc.

1000 PA Blvd.
1000 Welsh Dr.
Highville, PA 19444

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001 001-9999 000

Sample ID: BOMJD6
Matrix: Solid

MSA Group: 19448
Date Reported: 12/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 12/30/97
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	96.2	% Passing	0.1
	No. 4 Sieve	62.8	% Passing	0.1
	No. 40 Sieve	6.4	% Passing	0.1
	No. 200 Sieve	0.1	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.57		0.001

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Reviewed and Approved by:

W. Scott Fraser
W. Scott Fraser
Project Manager

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e-mail: gbrewer@msalabs.com





Midwest Analytical, Inc.

1300 W. 1300 S.
 1300 W. 1300 S.
 1300 W. 1300 S.

Attn: Mr. Kyle Clay
 Project: WHC/TMA 10985-001 001-9999-000

Sample ID: BOMJD9
 Matrix: Solid

Altitude: 4118
 Date Reported: 12/09/98
 Discard Date: 03/11/99
 Date Submitted: 01/26/99
 Date Sampled: 12/31/98
 Collected by:
 Purchase Order: L01187
 Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	89.8	% Passing	0.1
	No. 4 Sieve	57.1	% Passing	0.1
	No. 40 Sieve	0.2	% Passing	0.1
	No. 200 Sieve	ND	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.61		0.001

ND - Not detected at the limit of quantitation

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,
 Reviewed and Approved by:

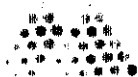
W. Scott Fraser
 W. Scott Fraser
 Project Manager

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 e-mail: gbrewer@msalabs.com





Metals Analytical, Inc.

Metals Analytical, Inc.
1000 West 2200 South
Salt Lake City, UT 84119
Phone: 801-973-0050
Fax: 801-972-6278
E-mail: service@msalabs.com

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985 001-001-9999-000

Sample ID: BOMJF5
Matrix: Solid

MA: 10985
MAI: 10985
Date Reported: 02/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 12/31/98
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	100	% Passing	0.1
	No. 4 Sieve	97.1	% Passing	0.1
	No. 40 Sieve	1.1	% Passing	0.1
	No. 200 Sieve	0.2	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.38		0.001

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281-320-2842 • FAX 281-320-0989
e-mail: gbrewer@msalabs.com





Midwest States Analytical, Inc.

MSA Environmental Services, Inc.
178 Welsh Road, East
Ligonville, PA 17034

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001-001-9999-000

Sample ID: BOMJJ3
Matrix: Solid

MSA Project: 10985-001-001-9999-000
MSA Report: 9448
Date Reported: 01/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 12/31/98
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	100	% Passing	0.1
	No. 4 Sieve	99.5	% Passing	0.1
	No. 40 Sieve	2.5	% Passing	0.1
	No. 200 Sieve	0.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.55		0.001

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

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Reviewed and Approved by:


W. Scott Fraser
Project Manager

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Service

Corporate Office
1645 West 2200 South, Salt Lake City, Utah 84119
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278
e-mail: service@msalabs.com

Southwest States Region
6223 Bayonne, Spring, Texas 77389
281-320-2842 • FAX 281-320-0989
e-mail: gbrewer@msalabs.com





Southwest States Analytical, Inc.

MSA
108 Welsh Road
Lionville, PA 19341

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001-001-9999-000

Sample ID: BOMJJ6
Matrix: Solid

Alt. Rep. #
MSA # 9418
Date Reported: 01/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 12/31/98
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	100	% Passing	0.1
	No. 4 Sieve	100	% Passing	0.1
	No. 40 Sieve	7.4	% Passing	0.1
	No. 200 Sieve	1.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.61		0.001

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,
Reviewed and Approved by:


W. Scott Fraser
Project Manager

10
Years of
Quality
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Corporate Office
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e-mail: gbrewer@msalabs.com





MSAI ANALYTICAL, INC.

1645 West 2200 South
Salt Lake City, Utah 84119
Lionville, PA 17048

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001-001-9999-000

Sample ID: BOMJF8
Matrix: Solid

MSAI Group: 9448
Date Reported: 02/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 01/02/98
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	100	% Passing	0.1
	No. 4 Sieve	99.7	% Passing	0.1
	No. 40 Sieve	14.9	% Passing	0.1
	No. 200 Sieve	1.5	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.60		0.001

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,
Reviewed and Approved by:

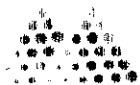

W. Scott Fraser
Project Manager

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Years of
Quality
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Corporate Office
1645 West 2200 South, Salt Lake City, Utah 84119
801-973-0050 • 1-800-973-8724(MSAI) • FAX 801-972-6278
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Southwest States Region
6223 Bayonne, Spring, Texas 77389
281-320-2842 • FAX 281-320-0989
e-mail: gbrewer@msalabs.com





Metals & Silica Analytical, Inc.

July 1998

1645 West 2200 South
Salt Lake City, UT 84119

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001-001 9999-000

Alt. Sample: 1
Alt. Sample: 9.18
Date Reported: 2/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 01/03/98
Collected by:
Purchase Order: L01187
Project No.:

Sample ID: BOMJH1
Matrix: Solid

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	100	% Passing	0.1
	No. 4 Sieve	97.3	% Passing	0.1
	No. 40 Sieve	14.3	% Passing	0.1
	No. 200 Sieve	2.1	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.56		0.001

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Respectfully Submitted,
Reviewed and Approved by:

W. Scott Fraser
W. Scott Fraser
Project Manager

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Southwest States Region
6223 Bayonne, Spring, Texas 77389
281-320-2842 • FAX 281-320-0989
e-mail: gbrewer@msalabs.com





Southwest States Analytical Inc

only for

MSA Lab
 1000 Welsh Road
 Lionville PA 19353

Attn: Mr. Kyle Clay
 Project: WHC/TMA 10985-001 001-9999-000

Sample ID: BOMJK2
 Matrix: Solid

A F
 TMA 01 9418
 Date Reported: 2/09/98
 Discard Date: 03/11/98
 Date Submitted: 01/26/98
 Date Sampled: 01/05/98
 Collected by:
 Purchase Order: L01187
 Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	100	% Passing	0.1
	No. 4 Sieve	100	% Passing	0.1
	No. 40 Sieve	100	% Passing	0.1
	No. 200 Sieve	0.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.10		0.001

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,
 Reviewed and Approved by:

W. Scott Fraser
 W. Scott Fraser
 Project Manager

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 6223 Bayonne, Spring, Texas 77389
 281-320-2842 • FAX 281-320-0889
 e-mail: gbrewer@msalabs.com





WESTERN STATES ANALYTICAL, INC.

1845 West 2200 South
Salt Lake City, UT 84119
801-973-0050 • 1-800-973-6724 (MSAI) • FAX 801-972-6278
e-mail: service@msalabs.com

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001-001 9999-000

Sample ID: BOMJK5
Matrix: Solid

Analysis: A
Date Reported: 01/26/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 01/05/98
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	100	% Passing	0.1
	No. 4 Sieve	100	% Passing	0.1
	No. 40 Sieve	3.6	% Passing	0.1
	No. 200 Sieve	1.5	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.64		0.001

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,
Reviewed and Approved by:

W. Scott Fraser
W. Scott Fraser
Project Manager

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Southwest States Region
6223 Bayonne, Spring, Texas 77389
281-320-2842 • FAX 281-320-0989
e-mail: gbrewer@msalabs.com





MS&L Analytical, Inc.

1000 East 1000

1000 East 1000
1000 West 1000
Bloomville, PA 15001

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985 001-001-9999-000

Sample ID: BOMJJ9
Matrix: Solid

Analysis Group: 1
Date Reported: 02/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 01/05/98
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	100	% Passing	0.1
	No. 4 Sieve	99.9	% Passing	0.1
	No. 40 Sieve	15.8	% Passing	0.1
	No. 200 Sieve	3.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.63		0.001

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Respectfully Submitted,
Reviewed and Approved by:

W. Scott Fraser
W. Scott Fraser
Project Manager

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Years of
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281-320-2842 • FAX 281-320-0989
e-mail: gbrewer@msalabs.com





Midwest States Analytical, Inc.

For Quality Control

EECEA Environmental
208 Welsh Road
Monroeville, PA 15141

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985 001 001 9999-000

Sample ID: BOMJD3
Matrix: Solid

MSAI Group: 9448
Date Reported: 02/09/99
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 12/30/97
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	74.0	% Passing	0.1
	No. 4 Sieve	44.0	% Passing	0.1
	No. 40 Sieve	3.7	% Passing	0.1
	No. 200 Sieve	1.6	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.57		0.001

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Respectfully Submitted,
Reviewed and Approved by:

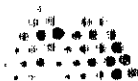
W. Scott Fraser
Project Manager

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Years of
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1645 West 2200 South, Salt Lake City, Utah 84119
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6223 Bayonne, Spring, Texas 77389
281-320-2842 • FAX 281-320-0989
e-mail: gbrewer@msailabs.com





Southwest States Analytical, Inc.

1000 South 2200 West

SECRA Environmental
108 Welsh Road
Ligonville, PA 17044

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001-001-9999-000

Sample ID: BOMJC7
Matrix: Solid

Lab: AL-101
TMA-101
Date Reported: 2/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 12/29/97
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	89.3	% Passing	0.1
	No. 4 Sieve	74.5	% Passing	0.1
	No. 40 Sieve	1.6	% Passing	0.1
	No. 200 Sieve	0.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.56		0.001

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,
Reviewed and Approved by:

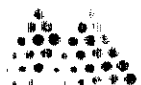
W. Scott Fraser
Project Manager

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Years of
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Corporate Office
1645 West 2200 South, Salt Lake City, Utah 84119
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e-mail: service@msallabs.com

Southwest States Region
6223 Bayonne, Spring, Texas 77389
281-320-2842 • FAX 281-320-0989
e-mail: gbrewer@msallabs.com





Metals Analytical Inc.

1100 RA Rd.
1000 Westwood Blvd.
Monroeville, PA 15146

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001 001-9999-000

Sample ID: BOMJK8
Matrix: Solid

Lab. Group: 1000
MSA Group: 13448
Date Reported: 02/09/98
Discard Date: 03/11/98
Date Submitted: 01/26/98
Date Sampled: 01/07/98
Collected by:
Purchase Order: L01187
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Sieve	100	% Passing	0.1
	4 Inch Sieve	100	% Passing	0.1
	1 Inch Sieve	80.8	% Passing	0.1
	No. 4 Sieve	21.3	% Passing	0.1
	No. 40 Sieve	0.5	% Passing	0.1
	No. 200 Sieve	ND	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.46		0.001

ND - Not detected at the limit of quantitation

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,
Reviewed and Approved by:

W. Scott Fraser
Project Manager

10
Years of
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e-mail: gbrewer@msailabs.com



Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						B98-004-13		Page 1 of 1	
Collector R. Fahlberg/D. St. John		Company Contact Curt Wittreich		Telephone No. 372-9586		Project Coordinator KOERNER, CC		Data Turnaround 45 Days			
Project Designation 216-B-2-2 Ditch - Soil		Sampling Location 200 East		SAF No. B98-004							
Ice Chest No. 844		Field Logbook No. EL-1281		Method of Shipment Fed. Ex.							
Shipped To TMA/WESTON		Offsite Property No. A930008		Bill of Lading/Air Bill No.							
POSSIBLE SAMPLE HAZARDS/REMARKS <i>~ 80,000 dpmB, < 0.5 mrem/hr on homogenized split spoon</i>		Preservation		None	None	None	None				
		Type of Container		G/P	aG	aG	Metal				
		No. of Container(s)		1	1	1	1				
Special Handling and/or Storage		Volume		2kg	60ml	60ml	400g				
SAMPLE ANALYSIS SDG H0129		See item (1) in Special Instructions		Activity Scan	Soil Cation Exchange Capacity - 9060	Moisture Content - D2216					
Sample No.	Matrix *	Sample Date	Sample Time								
BOMJC7	Soil	12-29-97	16:05	X	X	X	X				
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS Type A physical properties (1) Bulk Density - D3027; Particle Size (Dry Sieve) - D422; Particle Density - D854 12/31/97 DAS MPS 965 9503 217 8.8					
Relinquished By <i>R. Fahlberg</i> Date/Time 1-2-98 0805		Received By <i>Fed. Ex.</i> Date/Time 1-05-98									
Relinquished By <i>Fed. Ex.</i> Date/Time 1-05-98		Received By <i>D. Smith</i> Date/Time 1-05-98									
Relinquished By <i>Fed. Ex.</i> Date/Time 1-05-98		Received By <i>D. Smith</i> Date/Time 1-05-98									
LABORATORY SECTION		Received By				Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method REC'D 1-03-98				Disposed By Date/Time					

9801L019

**RECRA
LabNet**

[illegible]

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD

DATE RECEIVED: 01/08/98

RFW LOT # :9801L019

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOMJJ6						
% MOISTURE	007	S	98L&S018	12/31/97	01/27/98	01/28/98
CATION EXCHANGE CAPA	007	S	98LCE001	12/31/97	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	007	S		12/31/97		
BOMJF8						
% MOISTURE	008	S	98L&S018	01/02/98	01/27/98	01/28/98
CATION EXCHANGE CAPA	008	S	98LCE001	01/02/98	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	008	S		01/02/98		
BOMJH1						
% MOISTURE	009	S	98L&S018	01/03/98	01/27/98	01/28/98
CATION EXCHANGE CAPA	009	S	98LCE001	01/03/98	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	009	S		01/03/98		
BOMJK2						
% MOISTURE	010	S	98L&S018	01/05/98	01/27/98	01/28/98
CATION EXCHANGE CAPA	010	S	98LCE001	01/05/98	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	010	S		01/05/98		
BOMJK5						
% MOISTURE	011	S	98L&S018	01/05/98	01/27/98	01/28/98
CATION EXCHANGE CAPA	011	S	98LCE001	01/05/98	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	011	S		01/05/98		
BOMJJ9						
% MOISTURE	012	S	98L&S018	01/05/98	01/27/98	01/28/98
CATION EXCHANGE CAPA	012	S	98LCE001	01/05/98	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	012	S		01/05/98		
BOMJD3						
% MOISTURE	013	S	98L&S018	12/30/97	01/27/98	01/28/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD

DATE RECEIVED: 01/08/98

RFW LOT # :9801L019

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CATION EXCHANGE CAPA	013	S	98LCE001	12/30/97	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	013	S		12/30/97		
BOMJC7						
% MOISTURE	014	S	98L*S018	12/29/97	01/27/98	01/28/98
CATION EXCHANGE CAPA	014	S	98LCE001	12/29/97	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	014	S		12/29/97		

LAB QC:

CEC TOTAL	LC1 BS	S	98LCE001	N/A	02/03/98	02/06/98
CEC TOTAL	LC2 BSD	S	98LCE001	N/A	02/03/98	02/06/98
CATION EXCHANGE CAPA	MB1	S	98LCE001	N/A	02/03/98	02/06/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD

DATE RECEIVED: 01/10/98

RFW LOT # :9801L062

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
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BOMJK8

% MOISTURE	001	S	98L+S018	01/07/98	01/27/98	01/28/98
CATION EXCHANGE CAPA	001	S	98LCE001	01/07/98	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	001	S		01/07/98		

LAB QC:

CEC TOTAL	LC1 BS	S	98LCE001	N/A	02/03/98	02/06/98
CEC TOTAL	LC2 BSD	S	98LCE001	N/A	02/03/98	02/06/98
CATION EXCHANGE CAPA	MB1	S	98LCE001	N/A	02/03/98	02/06/98



RECRA
LabNet

RECRA LabNet Use Only

98011019

Custody Transfer Record/Lab Work Request

Client <u>TNU Broomfield Hwy Corridor</u>	Refrigerator #	
Est. Final Proj. Sampling Date	#/Type Container	Liquid Solid
Project # <u>10985-001-9999-00</u>	Volume	Liquid Solid
Project Contact/Phone #	Preservatives	
RECRA Project Manager <u>K.C.</u>	ANALYSES REQUESTED	ORGANIC VOA BNA Pest/PCB Herb
QC <u>STD</u> Del <u>SEA</u> TAT <u>30 DAY</u>		INORG Metal CN
Date Rec'd <u>1-8-98</u> Date Due <u>2-7-98</u>		
Account # <u>TNU HAWAIIAN</u>		

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only													
			MS	MSD																	
	001	BOMJDO			S	12/19/97	0920											X	X	X	X
	002	BOMJC4			I	12/19/97	1525											X	X	X	X
	003	BOMJDL	✓	✓	I	12/19/97	1425											X	X	X	X
	004	BOMJD9			I	12/19/97	0930											X	X	X	X
	005	BOMJF5			I	12/19/97	1115											X	X	X	X
	006	BOMJJ3			I	12/19/97	1305											X	X	X	X
	007	BOMJJ6			I	12/19/97	1420											X	X	X	X
	008	BOMJF8			I	12/19/97	1500											X	X	X	X
	009	BOMJH1			I	12/19/97	0912											X	X	X	X
	010	BOMJK2			I	12/19/97	1510											X	X	X	X

FIELD PERSONNEL: COMPLETE ONLY SHaded AREAS				DATE/REVISIONS:				RECRA LabNet Use Only			
Special Instructions: <u>ASA-CLIENT INFO</u>				→ <u>170MST = PST M D2216</u>				<div>Samples were: 1) Shipped <input checked="" type="checkbox"/> or Hand Delivered <input type="checkbox"/> Airbill # <u>10985-001-9999-00</u> 2) Ambient or Chilled 3) Received in Good Condition <input checked="" type="checkbox"/> or N 4) Labels Indicate Properly Preserved <input checked="" type="checkbox"/> or N 5) Received Within Holding Times <input checked="" type="checkbox"/> or N</div> <div>COC Tape was: 1) Present on Outer Package <input checked="" type="checkbox"/> or N 2) Unbroken on Outer Package <input checked="" type="checkbox"/> or N 3) Present on Sample <input checked="" type="checkbox"/> or N 4) Unbroken on Sample <input checked="" type="checkbox"/> or N COC Record Present Upon Sample Rec'd <input checked="" type="checkbox"/> or N</div>			
<u>Wain*</u>											
<u>*9659503217/8.8"</u>											
<u>9659503201/10.0"</u>											
<u>801396628388/18.3"</u>											
<u>SDG # H0129</u>											
Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time	Discrepancies Between Samples Labels and COC Record? Y or N <input checked="" type="checkbox"/> NOTES:			
<u>Ked. E</u>	<u>N. Smith</u>	<u>1/8/98</u>	<u>1036</u>								

ORIGINAL
REWRITTEN



**RECRA
LabNet**

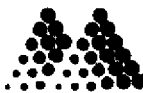
9801L019

Custody Transfer Record/Lab Work Request

[illegible]

98014062

ORIGINAL REWRITTEN



Mountain States Analytical, Inc.

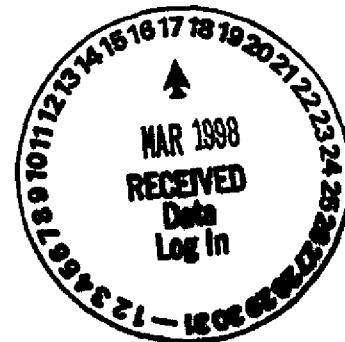
The Quality Solution

January 30, 1998

Mr. Kyle Clay
RECRA Enviromental, Inc.
208 Welsh Pool Road
Lionville, PA 19341

Reference:

Project: WHC/TMA 10985-001-001-9999-000
MSAI Group: 19449



Dear Mr. Clay:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

BOMJD6
BOMJK5

BOMJH1

BOMJK2

All holding times were met for the tests performed on these samples.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

W. Scott Fraser
Project Manager





MSAI Analytical Laboratory

MSAI Environmental
208 Welsh Pool Road
Lionville, PA 19341

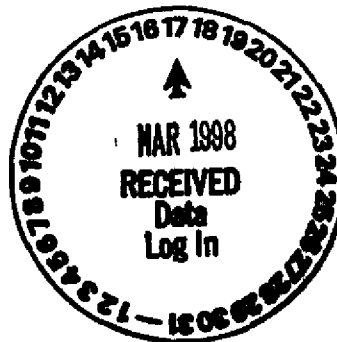
MSAI Group: 19449
Date Reported: 01/30/98
Date Received: 01/26/98

Attn: Mr. Kyle Clay
Project: WHC/TMA 10985-001-001-9999-000

Purchase Order: L01187
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
Sample:74578 - BOMJD6 2231 Bulk Density, sw, D-2937	115	lbs/cu ft	0.6
Sample:74579 - BOMJH1 2231 Bulk Density, sw, D-2937	93.6	lbs/cu ft	0.6
Sample:74580 - BOMJK2 2231 Bulk Density, sw, D-2937	104	lbs/cu ft	0.6
Sample:74581 - BOMJK5 2231 Bulk Density, sw, D-2937	90.5	lbs/cu ft	0.6

Test Method Summary:
2231 - ASTM D 2937



This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,
Reviewed and Approved by:

W. Scott Fraser
W. Scott Fraser
Project Manager

10
Years of
Quality
Service

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